ORDER NO.PHAMOS0501007C7
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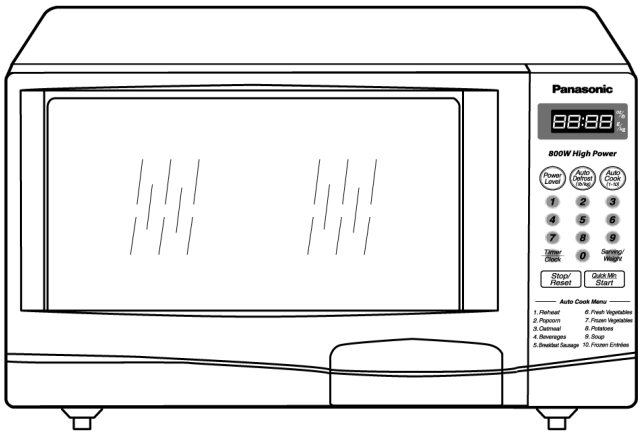
Service Manual

Microwave Oven



NN-S335BF
NN-S335WF
NN-S335WM

APH(USA)
CPH(Canada)
RPH(Mexico/Latin American)

Specification

Model	NN-S335BF	NN-S335WF	NN-S335WM
Power Source:	120V AC Single Phase, 60Hz		
Power Requirement:	1230W		
Output:	800W		
Microwave Frequency:	2450MHz		
Timer:	29min.90sec		
Outside Dimensions:	364mm(14 $\frac{1}{3}$")(D) x 482mm(19")(W) x 282mm(11$\frac{1}{5}$")(H)		
Oven Cavity Dimensions:	330mm(13")(D) x 325mm(12$\frac{3}{4}$")(W) x 218mm(8$\frac{9}{16}$")(H)		
Weight:	24 lbs.(11.0kg)		
PbF	This product with PbF		
Specifications subject to change without notice.			

Panasonic®

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained, qualified personnel.
2. Though this product has been manufactured in compliance with:
   "Federal Performance Standard 21 CFR Subchapter J"(D.H.H.S): U.S.A. models
   or "Radiation Emitting Devices Act"(Health and Welfare Canada): Canadian models
   it is very important all repairs should be made in accordance with procedures described in this manual to avoid being exposed to excessive microwave radiation.
3. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage."
4. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
5. Any serviceman who learns of any accident pertaining to microwave radiation leakage including the oven operating with open door should immediately notify the appropriate address listed below and Center for Devices and Radiological Health, DHHS.

IN U.S.A. (PASC)	Panasonic Services Company 50 Meadowland Parkway, Secaucus, New Jersey 07094 Attention: Technical Service Division. (201)348-7000	IN PUERTO RICO (PSC)	PSC San Gabriel Industrial Park 65th Infantry Ave. Km.9.5 Carolina, Puerto Rico 00985 (787)750-4300
		IN CANADA (PCI)	Panasonic Canada Inc. 5770 Ambler Drive, Mississauga, Ontario, L4W2T3 (905)624-5010

6. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts be replaced only with the manufacture's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the orginal design.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(A) Do not operate or allow the oven to be operated with the door open.
(B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
  (1) Interlock operation
  (2) Proper door closing
  (3) Seal and sealing surfaces (arcing, wear, and other damage)
  (4) Damage to or loosening of hinges and latches.
  (5) Evidence of dropping or abuse
(C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line, and cavity for proper alignment, integrity and connections.
(D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

CAUTION

About lead free solder (PbF)

Distinction of PbF PCB: PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution:
- Pb free solder has a higher melting point than standard solder; Typically the melting point is 50-70˚F(30 - 40˚C) higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 700± 20˚F (370 ± 10˚C).
- Pb free solder will tend to splash when heated too high (about 1100˚F/600˚C).

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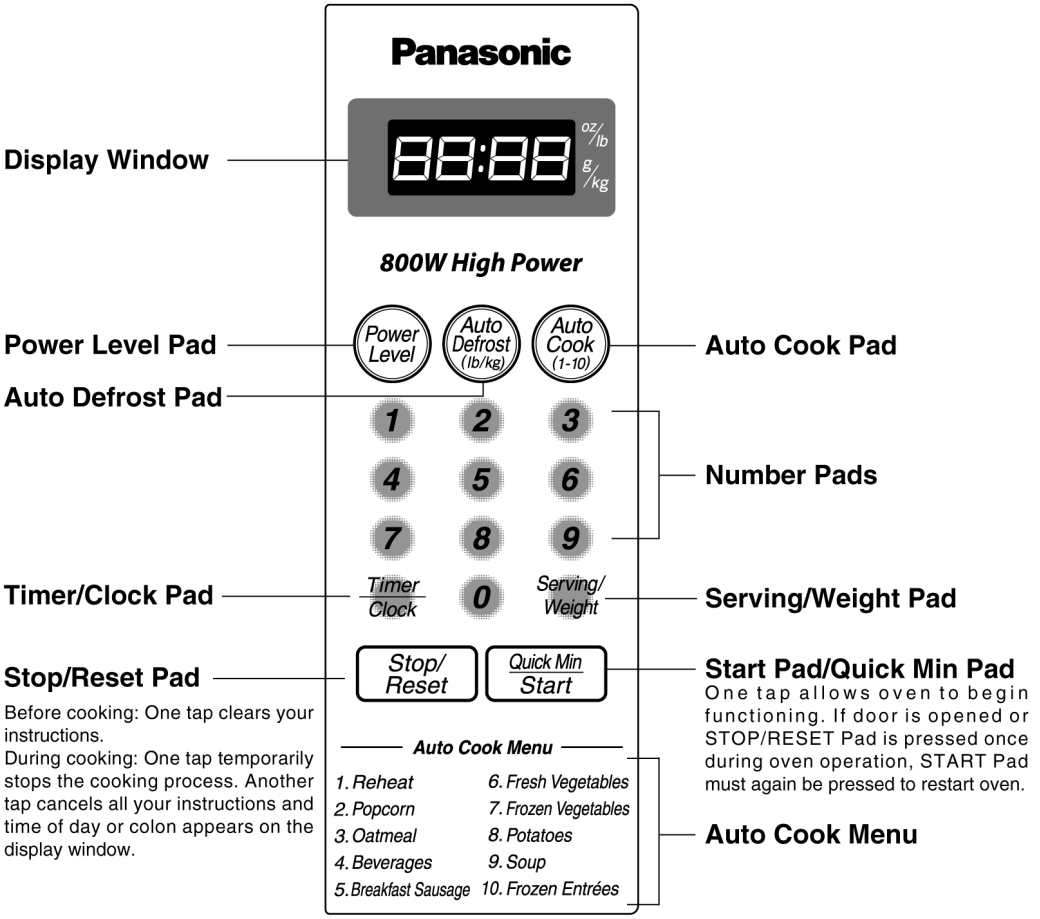
1 FEATURE CHART

MODEL / FEATURE	NN-S335BF	NN-S335WF	NN-S335WM
Three Stage Cooking	O	O	O
Auto Defrost	O	O	O
Auto Cook	O	O	O
Power Level Select	O	O	O
Quick Min	O	O	O
Timer	O	O	O
Digital Clock	O	O	O
Child Safety Lock	O	O	O

2 CONTROL PANEL

NN-S335BF/WF/WM



Display Window

Power Level Pad

Auto Defrost Pad

Auto Cook Pad

Number Pads

Timer/Clock Pad

Serving/Weight Pad

Stop/Reset Pad

Before cooking: One tap clears your instructions.
During cooking: One tap temporarily stops the cooking process. Another tap cancels all your instructions and time of day or colon appears on the display window.

Start Pad/Quick Min Pad

One tap allows oven to begin functioning. If door is opened or STOP/RESET Pad is pressed once during oven operation, START Pad must again be pressed to restart oven.

Auto Cook Menu

Pull Door Handle:
Pull to open the door. Opening the door during cooking will stop the cooking process without cancelling the program. Cooking resumes as soon as the door is closed. The oven light will turn on and stay on whenever the door is opened. It is quite safe to open the door at any time during a cooking program and there is no risk of microwave exposure.

3 OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

When you pluge the power supply cord into the wall outlet, microwave oven automatically enter into the state of lb / oz. If you want to use g / kg state, please press **Quick Min/Start** pad after pluging the power source.

3.1. To Set Clock

OPERATION	SCROLL DISPLAY
1. Plug the power supply cord into wall outlet.	
2. Press **Timer/Clock** pad twice.	
3. Enter time of day (TOD) by pressing appropriate **Number** pads.	
4. Press **Time/Clock** pad. TOD has now been registered into the digital programmer circuit and will count up by minutes.	

3.2. Time Cooking for Two Stage

OPERATION	SCROLL DISPLAY
1. Place a water load in the oven.	
2. Press **Power Level** pad once to set High power. (1st stage)	
3. Set for 5 seconds by pressing **Number** pads. 5 sec.=5	
4. Press **Power Level** pad 5 times to set Medium power. (2nd stage)	
5. Set for 1 minute by pressing **Number** pads. 1 Min.=1 0 0	
6. Press **Quick Min/Start** pad.	
7. When 1st stage cooking time has elapsed. Oven beeps twice and automatically switches to 2nd stage cooking.	
8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off.	Time of day or colon if set appears in the display

3.3. Auto Defrost

OPERATION	SCROLL DISPLAY
1. Press **Auto Defrost** Pad.	
2. Set the weight for 1 lb by pressing **Number** pads. 1 lb=1 0	
3. Press **Quick Min/Start** pad.	
4. Press **Stop/Reset** Pad twice.Oven shuts off.	Time of day or colon if set appears in the display.

3.4. Auto Cook

OPERATION	SCROLL DISPLAY
1. Press **Auto Cook** pad 3 times Oatmeal.	
2. Press **Serving / Weight** pad.(Select 0.5, 1 slices)	
3. Press **Quick Min/Start** pad.	
When cooking time has elapsed, Oven beeps 5 times and shuts off.	Time of day or colon if set appears in the display.

3.5. To Set Child satety Lock

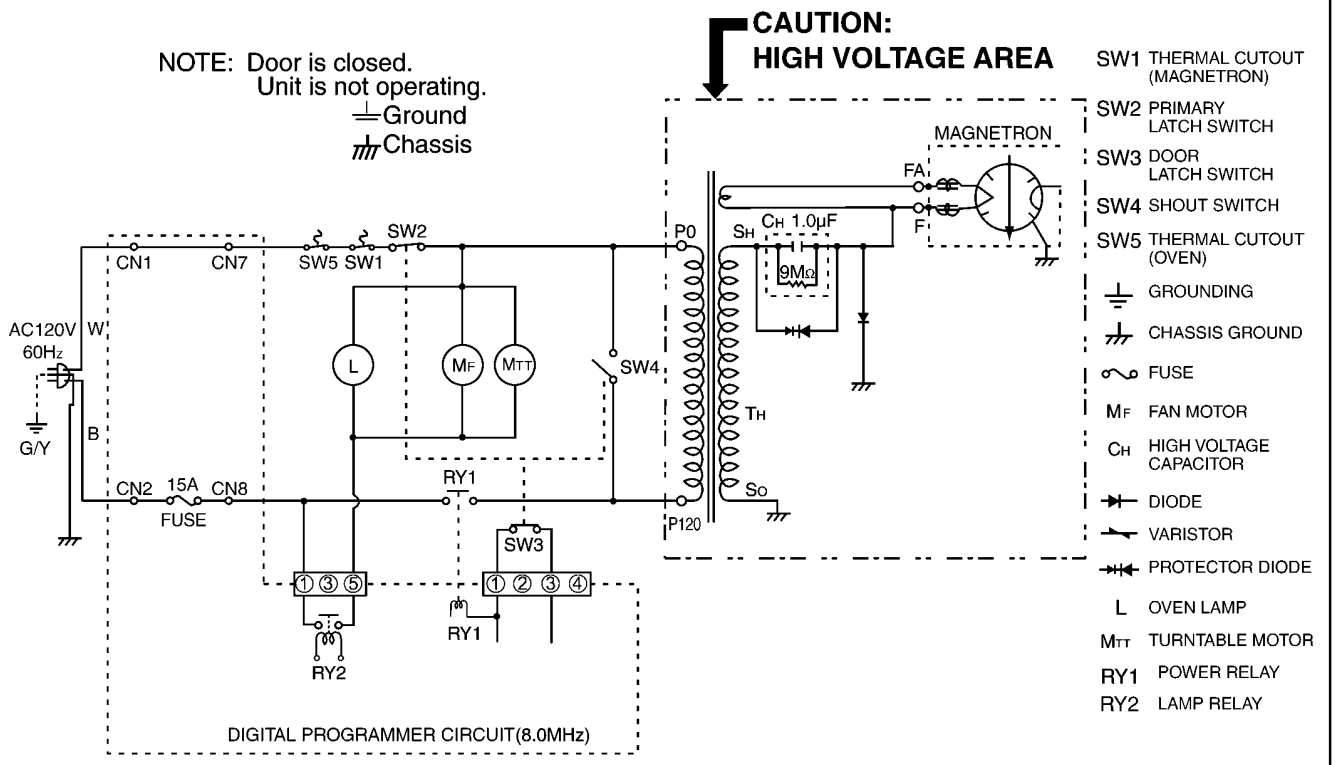
OPERATION	SCROLL DISPLAY
1. Press **Stop/Reset** pad 3 times continuously. "Child" appears in the display.	

3.6. To Reset Child Lock

OPERATION	SCROLL DISPLAY
1. Press **Stop / Reset** pad 3 times continuously.	Time of day or colon if set appears in the display.

4 SCHEMATIC DIAGRAM

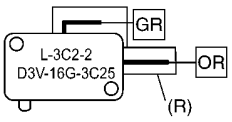
4.1. APH & RPH



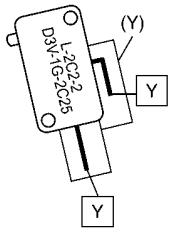
IMPORTANT SAFETY NOTICE: POTENTIALS ABOVE 120V IS PRESENT ON THE PARTS AND WIRING IN SECONDARY CIRCUIT OF HIGH VOLTAGE TRANSFORMER. WHEN OVEN IS ENERGIZED. EXTREMELY CARE SHOULD BE TAKEN DURING REPAIR.

WIRING DIAGRAM

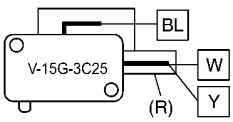
NOTE: * When replacing, check the lead wire color as shown.
* Colors shown by ( ) indicate colors of lead wire connector housing.



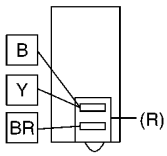
SECONDARY LATCH SWITCH TOP



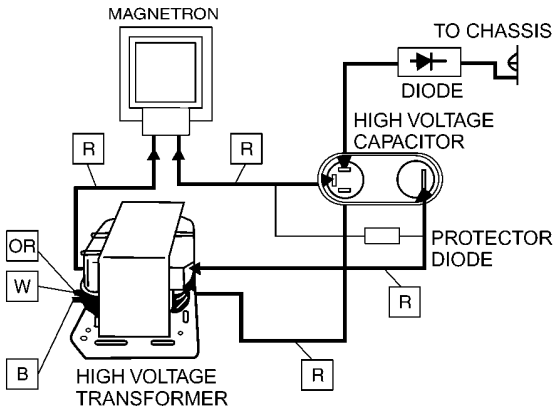
SHORT LATCH SWITCH MIDDLE



PRIMARY LATCH SWITCH BOTTOM



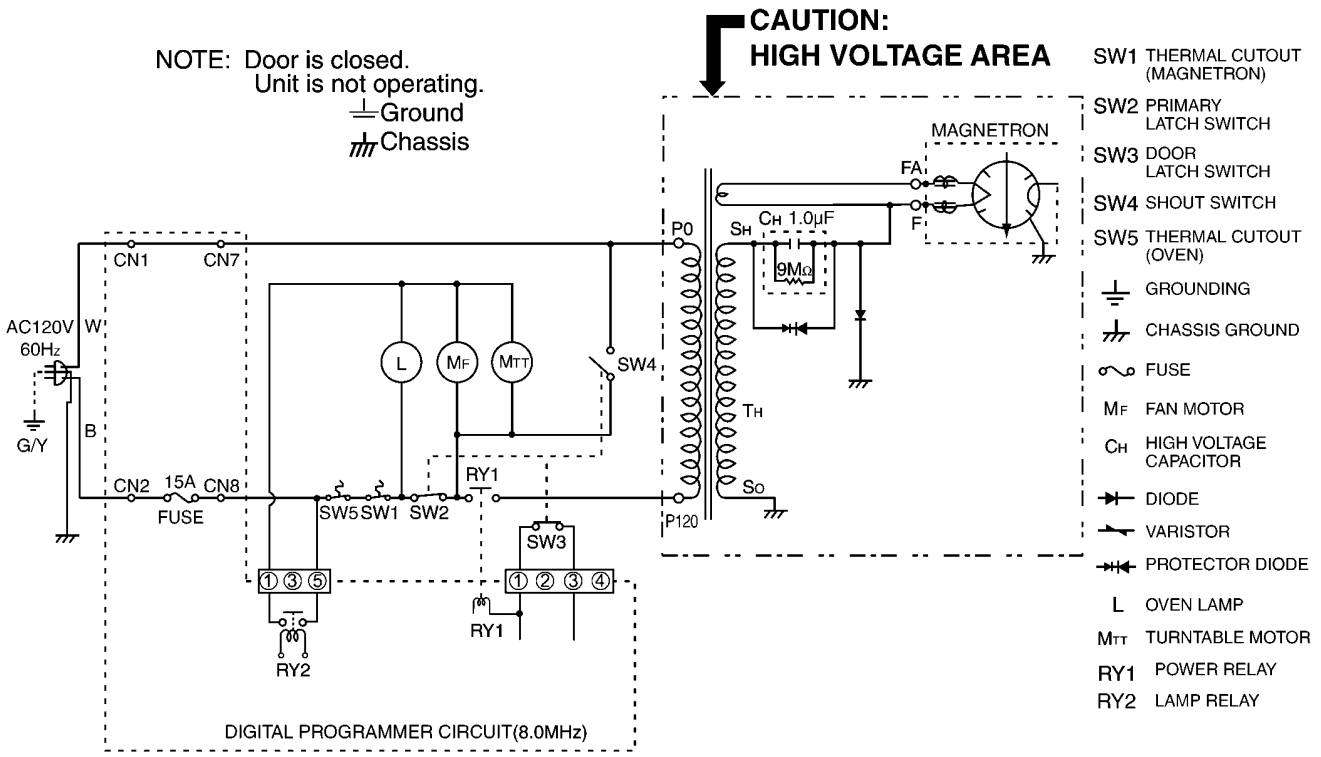
POWER RELAY B (RY1)



SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK
G	GREEN
N	NATURAL

(S-6S2)

4.2. CPH



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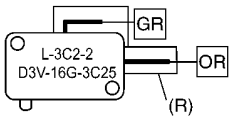
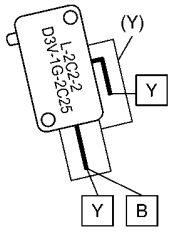
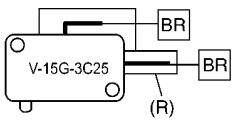


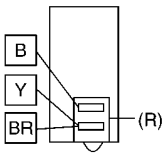
SECONDARY LATCH SWITCH TOP



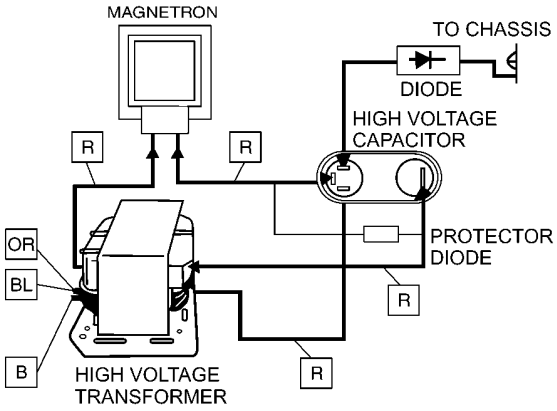
SHORT LATCH SWITCH MIDDLE



PRIMARY LATCH SWITCH BOTTOM



POWER RELAY B (RY1)



SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK
G	GREEN
N	NATURAL

(S-6S2)

5 DESCRIPTION OF OPERATING SEQUENCE

5.1. Variable power cooking control

The coil of power relay B (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay B contacts in order to vary the output power of the microwave oven from ”Low” to “High” power. One complete ON and OFF cycle of power relay B is 22 seconds. The relation between indications on the control panel and the output of the microwave oven is as shown in table.

NOTE:

The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

POWERSETTING	OUTPUT POWER(%) APPROX.	ON-OFF TIME OF POWER RELAY B (RY1)	
		ON(SEC)	OFF(SEC)
HIGH	100%	22	0
MEDIUM-HIGH	70%	17	5
MEDIUM	50%	13	9
MEDIUM-LOW	30%	8	14
LOW	15%	5	17
DEFROST	30%	8	14

5.2. Auto Defrost, Auto Reheat, Auto Cook control

When those Auto Control feature is selected and the Start Pad is tapped:

1. The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window.
   Table shows the corresponding cooking times for respective serving or weight by categories.
2. When cooking time in the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.

Auto Defrost

WEIGHT SELECTED	COOKING TIME
1.0KG	9 min.23 sec.

Auto Cook

CATEGORY	WEIGHT SELECTED	COOKING TIME
Oatmeal	1 SERV	4 min.30 sec.

6 CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION
Servicemen should remove their watches whenever working close to or replacing the magnetron.

6.1. Check the grounding

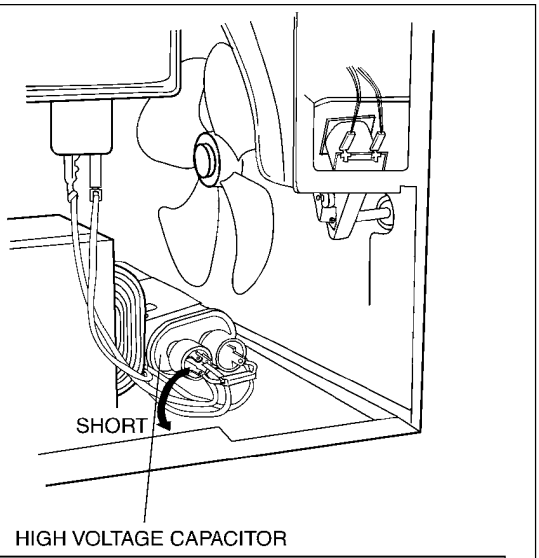
Do not operate on a 2-wire extension cord. The microwave oven is designed to be grounded when used. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

6.2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge.

WARNING
There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING
Never touch any circuit wiring with your hand nor with an insulated tool during operation.



Touch chassis side first then short to the high voltage capacitor terminal.

6.3. When parts must be replaced, remove the power plug from the outlet.

6.4. When the 15 Amp fuse is blown due to the operation of short switch:

WARNING
When the 15 Amp fuse is blown due to operation of the interlock monitor switch, you must replace all of the components (Primary latch switch, Door switch, Short switch and Power relay B (RY1)).

1. This is mandatory. Refer to “Adjustments and Measurement” for these switches.
2. When replacing the fuse, confirm that it has the appropriate rating for these models.
3. When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

6.5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.

6.6. Confirm after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. Microwaves might leak if screws are not properly tightened.
2. Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
3. Check for microwave energy leakage. (Refer to procedure for measuring microwave evergy leakage.)

CAUTION
MICROWAVE RADIATION
USE CAUTION NOT TO BECOME EXPOSED TO RADIATION FROM THE MICROWAVE MAGNETRON OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE
1.The following components have potentials above 2000V while the appliance is operated.
* Magnetron
* High voltage transformer
* High voltage diode
* High voltage capacitor
Pay special attention to these areas.
2.When the appliance is operated with the door hinge or magnetron adjusted incorrectly, the microwave leakage can exceed more than 5mW/cm^2. After repair or exchange, it is very important to check that magnetron and the door hinge is correctly installed.

7 DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

7.1. Magnetron

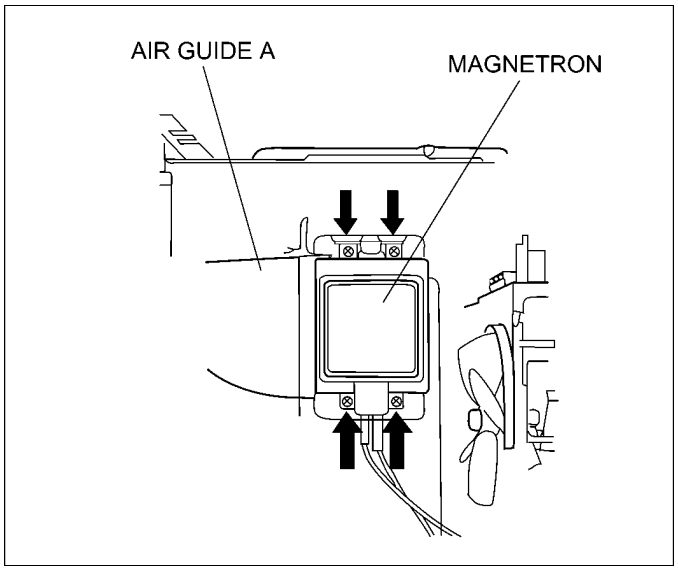
1. Discharge the high voltage capacitor.
2. Remove 1 screw holding air guide A & reinforce bracket.
3. Disconnect 2 high voltage lead wires from magnetron filament terminals.
4. Remove 4 screws holding the magnetron.

NOTE:

After replacement of the magnetron,tighten mounting screws properly in an X pattern, making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

CAUTION
When replacing the magnetron, be sure the antenna gasket is in place.

CAUTION
When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high volatge transformer should be connected to “F terminal” and the lead wire from high voltage capacitor should be connected to “FA terminal”.



7.2. Digital Programmer Circuit (DPC) and membrane key board.

NOTE:

Be sure to ground any static electric charge built up on your body before handling the DPC.

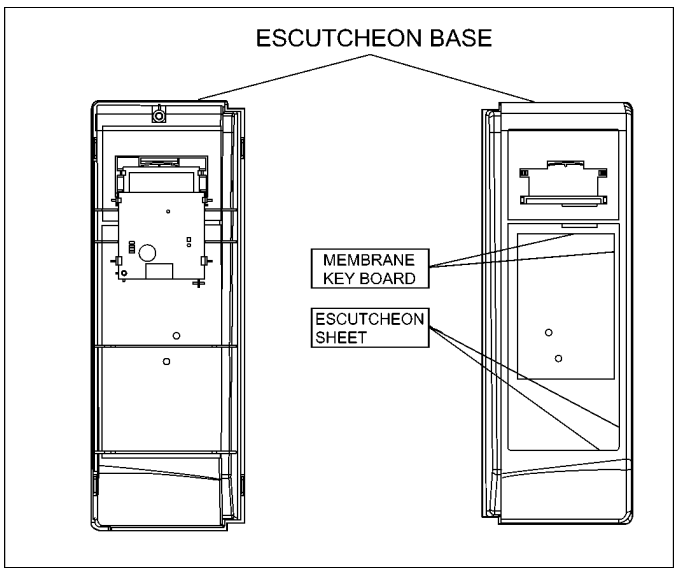
1. Release 1 flat cable from D.P.C board holding on the oven cavity.
2. Remove 1 screw holding escutcheon base and slide the escutcheon base upward slightly.
3. Remove 1 screws holding D.P.C board.
4. Separate D.P.C board from tabs on the escutcheon base and remove D.P.C board.
5. Remove rubber connector.
6. Separate display from tabs on the escutcheon base and remove display.

To replace membrane key board

7. Push the upper part of key board (display window portion) from back of escutcheon base, and peel off escutcheon sheet & membrane key board completely from escutcheon base.

NOTE:

1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using a hair dryer is recommended for smoother removal.
2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.
3. Alignment position of membrane key board is as follows;
Membrane key board: Right and upper edges
Escutcheon sheet: Right and upper edges



7.3. Low voltage transformer and/or power relays (RY1, RY2)

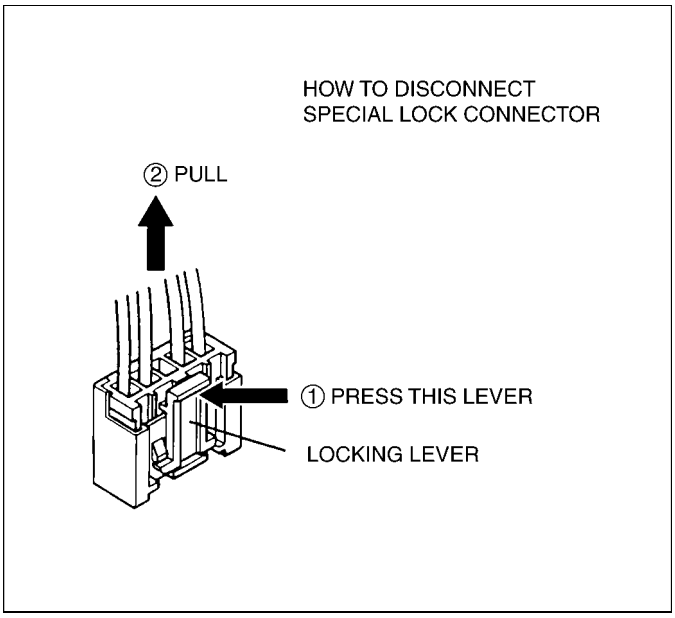
NOTE:

Be sure to ground any static electric charge built up on your body before handling the DPC.

1. Disconnect all connectors from D.P.C..
2. Remove 2 screws holding D.P.C. board on the oven cavity.
3. Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

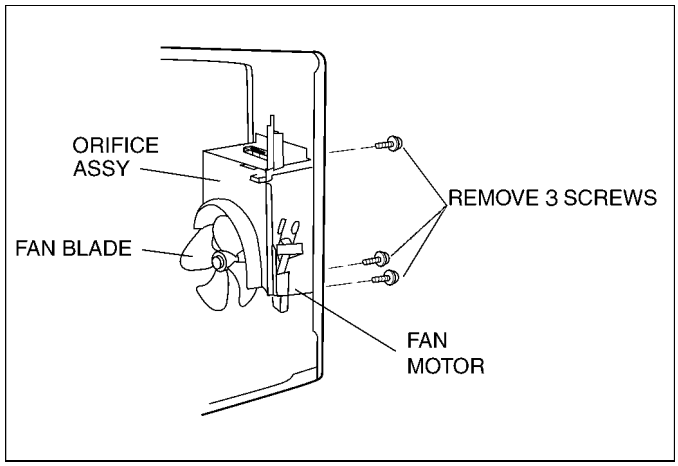
   NOTE:

   Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.
4. With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays. Replace components, making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.



7.4. Fan motor

1. Disconnect 2 lead wires from fan motor terminals.
2. Remove 1 screw holding diode (U) on side of the oven.
3. Disconnent 2 H.V. lead wires which linking to H.V. transformer from H.V. capacitor terminals.
4. Remove 3 screws holding orifice assy and detach the orifice assy from oven assy.
5. Remove fan blade from the motor shaft by pulling it straight out.
6. Remove 2 screws holding fan motor on orifice assy and detch the fan motor from orifice assy.



7.5. Door assembly

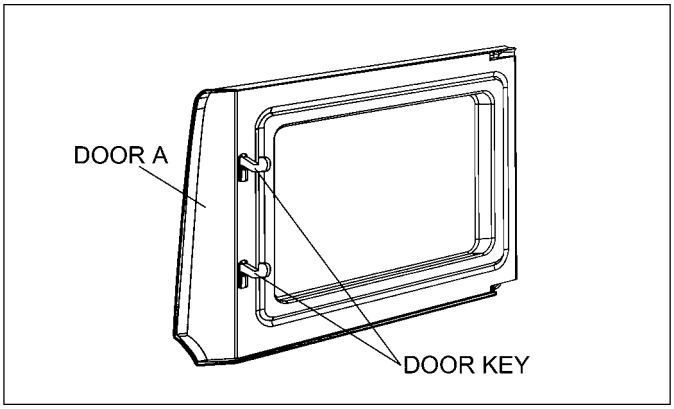
1. Remove door C from door E by carefully pulling outward starting from upper right hand corner using a flat blade screwdriver.
2. Separate door E from tabs on door A and remove door A.
3. Remove door screen B from door A.
4. Remove handle spring which hitching door handle, seperate door handle from door A by pulling outward door handle slightly, moving it towards the side of door A and out.
5. Open Door E at the opening angle of approximately 10°**(Note: The door cannot be removed if the opening angle is greater than 10°)**.
6. Remove the door E from its hinges by pushing the door E´s bottom upward and out.
7. Remove door key and door key spring from door E.
8. Replace other components.

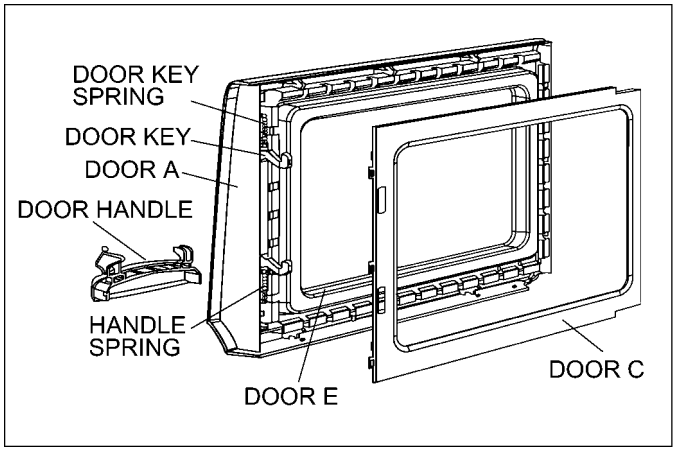
NOTE:

Door alignment is crucial. If door is misaligned, apply pressure until alignment is achieved.

NOTE:

After replacement of the defective component parts of the door, reassemble, and perform microwave leakage test.





7.6. Turntable motor

1. Remove the motor cover by breaking off at the 4 spots indicated by arrows with a cutter or the like.

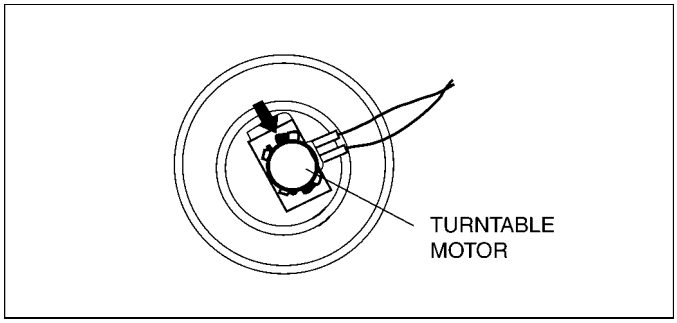
NOTE:

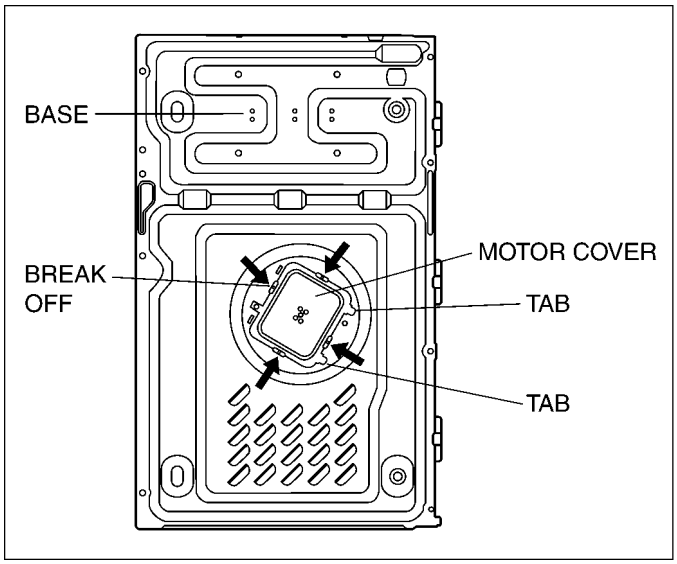
After breaking off the motor cover, make sure that cut-off portions are properly trimmed off or bent to inside so that no sharp edges will be exposed to the outside.

2. Disconnect 2 lead wires connected to the turntable motor.
3. Remove the turntable motor by removing 1 screw.

NOTE:

After reinstalling the new turntable motor and reconnecting the 2 lead wires, reinstall the motor cover by rotating it around 180°, tucking the 2 tabs under the base into the 2 provided slots, then screw the single tab to the base using a screw.





8 COMPONENT TEST PROCEDURE

CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

8.1. Primary Latch Switch, (Door Switch and Power Relay B) Interlocks.

1. Unplug the lead connectors to Power Relay B and verify continuity of the power relay B 1-2 terminals.
2. Unplug lead connectors to primary Latch switch and Door Switch.
3. Test the continuity of switches at door opened and closed positions with ohm meter (low scale).
   Normal continuity readings should be as follows.

	Door Opened	Door Closed
Primary Latch Switch	∞ Ω (open)	0 Ω (close)
Door Switch	∞ Ω (open)	0 Ω (close)
Power Relay B	∞ Ω (open)	∞ Ω (open)

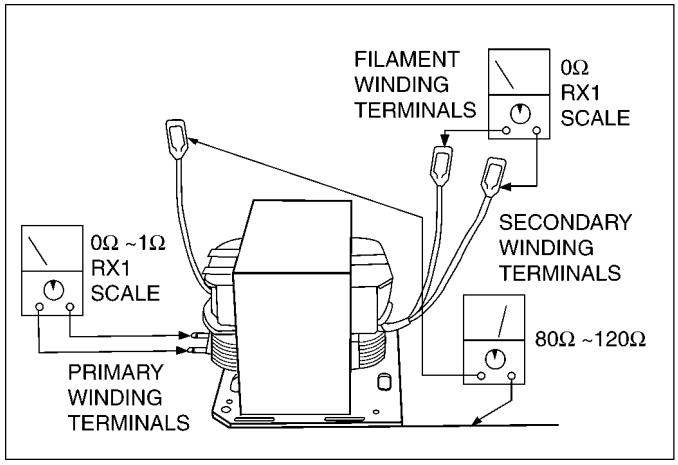
8.2. Short Switch & Monitor

1. Unplug lead wires from H.V.transformer primary terminals.
2. Connect test probes of ohm meter to the disconnected leads of the H.V. Transformer.
3. Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter.
   Normal continuity readings should be as follows.

Door Opened	Door Closed
0 Ω	∞ Ω

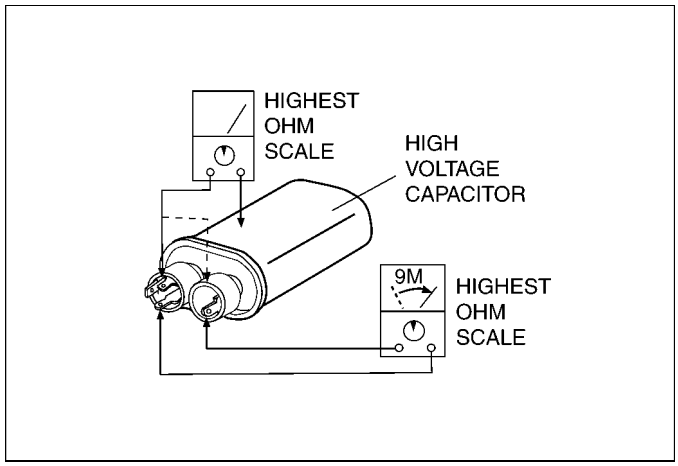
8.3. High voltage transformer

1. Remove connectors from the transformer terminals and check continuity.
2. Normal (cold) resistance readings should be as follows:
   Secondary winding..... Approx. 80 Ω~120 Ω
   Filament winding..... Approx. 0 Ω
   Primary winding..... Approx. 0 Ω ~1 Ω



8.4. High voltage capacitor

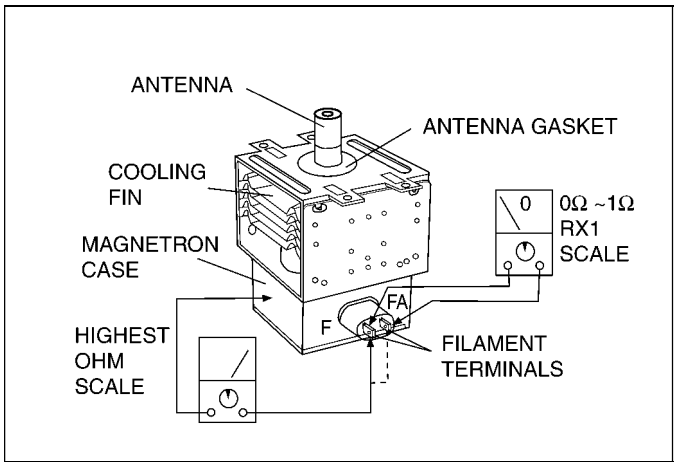
1. Check continuity of capacitor with meter on highest OHM scale.
2. A normal capacitor will show continuity for a short time, and then indicate 9MΩ once the capacitor is charged.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant 9MΩ.
5. Resistance between each terminal and chassis should be infinite.



8.5. Magnetron

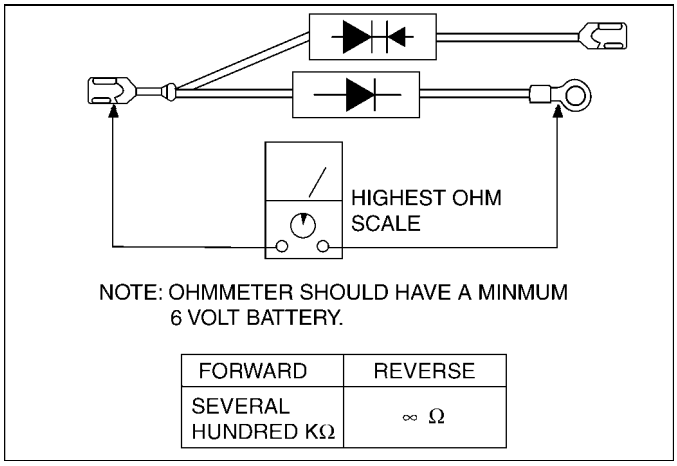
Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron:

1. Isolate magnetron from the circuit by disconnecting the leads.
2. A continuity check across magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.



8.6. Diode (U)

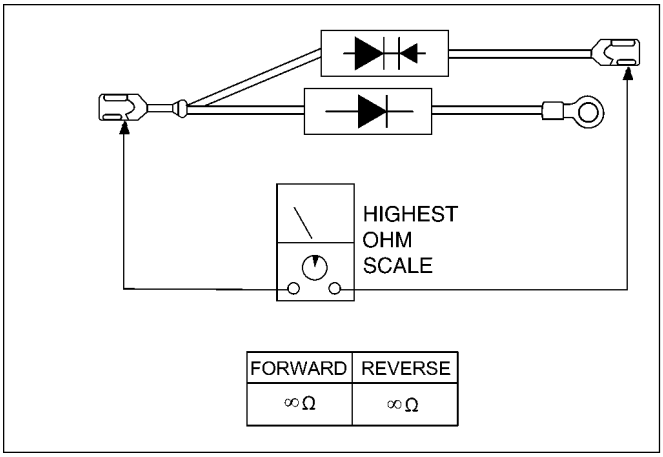
1. Isolate the diode (U) from the circuit by disconnecting the leads.
2. With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals.Reverse the meter leads and again observe the resistance reading.Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.
   A normal diode's resistance will be infinite in one direction and several hundred KΩ in the other direction.



NOTE: OHMMETER SHOULD HAVE A MINMUM 6 VOLT BATTERY.

FORWARD	REVERSE
SEVERAL HUNDRED KΩ	∞ Ω

3. With the ohmmeter set on the highest resistance scale, measure the resistance across the protector diode terminals. Reverse the meter leads and again observe the resistance reading.
   A normal protector diode's resistance will be infinite in both directions. It is faulty if it shows continuity in one or both directions.



FORWARD	REVERSE
∞Ω	∞Ω

8.7. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

9 MEASUREMENTS AND ADJUSTMENTS

WARNING

1. For continued protection against radiation hazard, replace only with identical replacment parts. (For touch models part No. J61424T00AP Type No. V-15G-3C25 for Primary latch switch Part No. J61414T00AP, Type No. D3V-16G-3C25 for Secondary latch switch and Part No.J61784T00AP, Type No. D3V-1G-2C25 for short switch)
2. When the 15 Amp. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. Also replace power relay B (Part. No. AEGG5G1A18, Type No. G5G-1A12VDC) when the continuity check reads shorted contacts (1--2). Then follow the adjustment procedures below.
3. Interlock swich replacement -- In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.
4. Refer to schematic diagram to ensure proper connection.

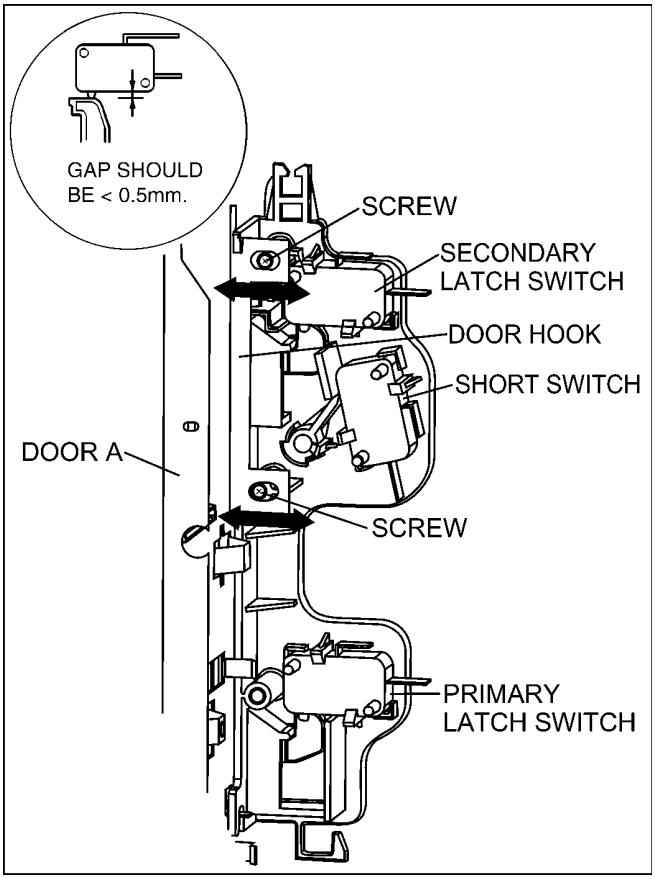
9.1. Adjustment of Primary latch switch, Secondary latch switch and Short switch.

1. Mount the Primary latch swith, the Secondary latch switch and the Short switch to the door hook assembly as shown in ILL.

   NOTE:

   No specific individual adjustments during installation of the Primary latch switch, Secondary latch switch or Short switch to the door hook are required.

2. When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of the arrows in the illustration so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.
3. Reconnect the short switch and check the coninuity of the monitor circuit and all latch switches again by following the component test procedures.



9.2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

- 1 liter beaker
- Glass thermometer
- Wrist watch or stopwatch

NOTE:

Check the line voltage under load.Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurately as possible.

1. Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the water's temperature. (recorded as T1).
2. Place the beaker on the center of glass tray.
   Set the oven for High power and heat it for exactly one minute.
3. Stir the water again and read the temperature of the water. (recorded as T2).
4. The normal temperature rise at High power level for each model is as shown in table.

TABLE (1L-1min.test)

RATED OUTPUT	TEMPERATURE RISE
800W	Min.12.6°F(7.0°C)

10 PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

WARNING

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm^2 (1mW/cm^2 for Canada) inform PASC, PSC, or PCI immediately. After repairing or replacing any radiation safety device, keep a written record for future reference, as required by D.H.H.S. and Health and Welfare Canada regulation. This requirement must be strictly observed. In addition, the leakage reading must be recorded on the service repair ticket while in the customer's home.

NOTE:

The U.S. Government standard is 5 mW/cm^2 while in the customer s home. 2mW/cm^2 stated here is our own voluntary standard. (1mW/cm^2 for Canada)

10.1. Equipment

- Electromagnatic radiation monitor
- Glass thermometer 212 °F or 100 °C
- 600cc glass beaker

10.2. Procedure for measuring radiation leakage

Note before measuring.

- Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.
- To prevent false readings the test probe should be held by the grip portion of the handle only and moved along the shaded area in Figure no faster than 1 inch/sec (2.5cm/sec).
- Leakage with the outer panel removed ..... less than 5mW/cm^2.
- Leakage for a fully assembled oven with door normally closed ..... less than 2mW/cm^2 (1mW/cm^2 for Canada).
- Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door ..... less than 2mW/cm^2.

1. Pour 275 ± 15cc (9ozs ± 1/2oz) of 20°C ± 5°C (68 ± 9°F) water in a beaker which is graduated to 600cc, and place in the center of the oven.
2. Set the radiation monitor to 2450MHz and use it following the manufacturer´s recommended test procedure to assure correct results.
3. When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.
4. Tap the start pad or set the timer and with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

10.2.1. Measurement with the outer panel removed.

Whenever you replace the magnetron, measure for radiation leakage before the outer panel is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.

WARNING

Avoid contacting any high voltage parts.

10.2.2. Measurements with a fully assembled oven.

After all components, including outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening and air inlet openings.

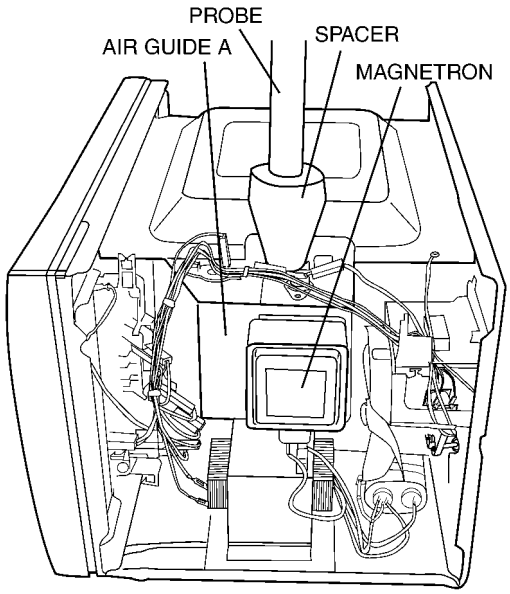
10.3. Record keeping and notification after measurement

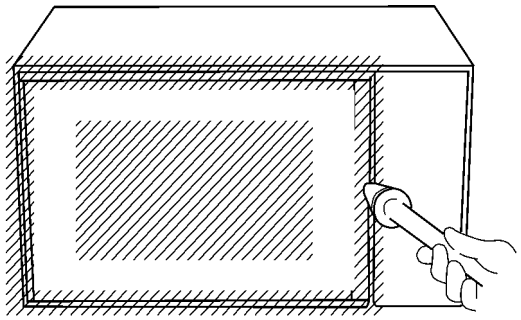
1. After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero.

   A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.
2. Should the radiation leakage be more than 2 mW/cm^2 (1mW/cm for Canada) after determining that all parts are in good condition, functioning properly, and genuine replacement parts as listed in this manual have been used, immediately notify PASC, PSC or PCI.

10.4. At least once a year, have the radiation monitor checked for calibration by its manufacturer.

WARING
AVOID CONTACTING ANY HIGH VOLTAGE PARTS.





MOVE PROBE ALONG SHADED AREA(////////)AROUND EXHAUST OPENINGS AND AROUND AIR INLET OPENING

11 TROUBLESHOOTING GUIDE

CAUTION

1. Check grounding before checking for trouble.
2. Be careful of high voltage circuit.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer,disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be damaged or the connector cannot be removed.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. 120V AC is present on the digital programmer circuit (Terminals of power relay´s and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

First of all operate the microwave oven following the correct operating procedures in order to find the exact cause of any trouble.

	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness 2. Open thermal cutout 3. Open low voltage transformer 4. Defective DPC	Check fan motor if thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Shorted H.V. capacitor 5. Shorted H.V. transformer (NOTE 2) 6. Shorted diode (U)	Check adjustment of primary, secondary latch switch and short switch including door.
		NOTE 1: All of these switches must be replaced at the same time. Check continuity of power relay B (RY1)'s contacts (between 1 and 2) and if it has continuity replace power relay B (RY1) also. NOTE 2: When H.V. transformer is replaced, check diode and magnetron also.	
3.	Oven does not accept key input(Program)	1. Key input is not proper in-sequence 2. Open or loose connection of membrane key pad to DPC (Flat cable or rubber connector) 3. Shorted or open membrane key board 4. Defective DPC	Refer to operation procedure. Refer to DPC troubleshooting.
4.	Fan motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
5.	Timer starts count down but no microwave oscillation. (No heat while oven lamp and fan motor turn on)	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will cause lower magnetron filament voltage and cause magnetron to lower output and/or be intermittent. 3. Defective high voltage component H.V. transformer H.V. capacitor H.V. diode (U) Magnetron 4. Open or loose wiring of power relay B (RY1) 5. Defective primary latch switch 6. Defective DPC or power relay B (RY1)	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective. Refer to DPC troubleshooting
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician
8.	Fan motor turns on and turntable rotates when door is opened.	1. Shorted primary latch switch.	

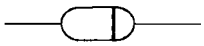
	SYMPTOM	CAUSE	CORRECTIONS
9.	Oven does not operate and return to plugged in mode as soon as start pad is pressed.	1. Defective DPC	Check the grounding lead wire and D.P.C. board.
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. transformer	
11.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor 2. Defective turntable motor	
12.	Oven stops operation during cooking.	1. Open or loose wiring of primary and secondary latch switch 2. Operation of thermal cutout	Adjust door and latch switches.
13.	15A fuse is blown.	1. Shorted lead wire harness 2. Defective short switch 3. Defective primary latch switdh 4. Shorted H.V. capacitor 5. Shorted H.V. diode 6. Defective magnetron 7. Shorted H.V. transformer 8. Shorted diode (U) 9. Defective power relays 10.Defective DPC	Check adjustment of latch switches and door Replace H.V. Diode and protector diode (*NOTE) Replace Magnetron and protector diode (*NOTE) Replace H.V. Transformer and protector diode (*NOTE)
		NOTE : Be sure to replace protector diode together with those H.V. components. In this case, only D2 of protector diode may be shorted due to faulty H.V. component. Therefore, if protector diode is not replaced together, high voltage transformer will be damaged (over heated).	

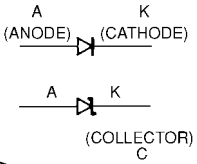
11.1. Trouble related to Digital Programmer Circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in	1	Fuse pattern of DPC	Normal	→ STEP2
			Open(NOTE)	Shorted circuit of ZNR, L.V.T,Oven Lamp etc. Replace DPC
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step3
	3	IC-1 pin 23 voltage (Emitter of Q10)	Abnormal	ZD10,Q10
			Normal=3.3V	IC1,CX320 Display
NOTE Procedure of fuse pattern repairing is as follows: 1. When the fuse pattern (PF2) opens. (1) Remove jumper wire (PF1). (2) Insert the removed jumper wire (PF1) to "(PF2)"position and solder it. If both "PF1" and "PF2" fuse patterns are open, please replace DPC. 2. When the fuse pattern (PF4) opens. (1) Remove jumper wire (PF3). (2) Insert the removed jumper wire (PF3) to "(PF4)" position and solder it. If both "PF3" and "PF4" fuse patterns are open, please replace DPC. NOTE:*At the time of these repairs, made visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.				
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 29 voltage	Abnormal	IC-1
			Normal	BZ210, Q210
Power relay A(RY-2) does not turn on even though the program had been set and the start pad in tapped	1	IC-1 pin 1 voltage while operation	Abnormal	IC-1
			Normal=5V	→ Step 2
	2	Short circuit between collector and Emitter of Q225	Still not turn on	RY-2
			RY-2 turns on	Q225
No microwave oscillation at any power	1	IC-1 pin 4 voltages while operation at high power	Abnormal	IC-1
			Normal=5V	→ Step 2
	2	Transistor Q223 & Q224	Abnormal	Q223 and (or) Q224
			Normal	RY-1
Dark or unclear display	1	Replace display and check operation	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment	1	Replace IC-1 and check operation	Normal	IC-1
			Abnormal	DISPLAY

11.2. How To CHECK THE SEMICONDUCTORS USING AN OHM METER

Diode

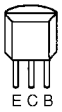


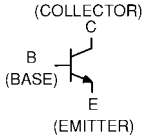


	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

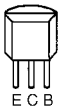
NPN Transistor
2SC.....
2SD.....

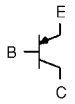




	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

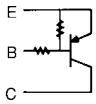
PNP Transistor
2SA.....
2SB.....





	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

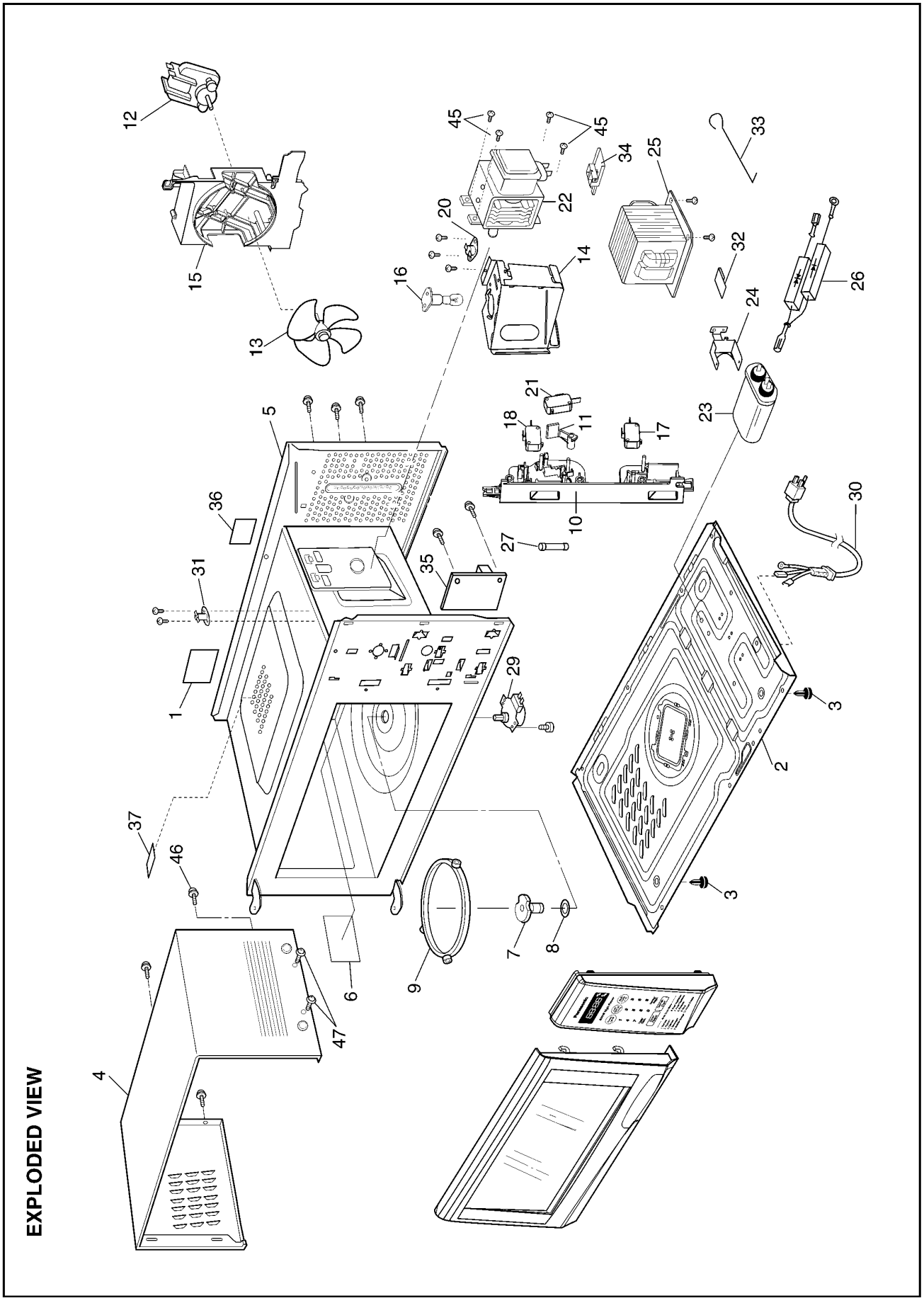
Digital Transistor
PNP Transistor



	FORWARD	REVERSE
E-B	10kΩ-30kΩ	10kΩ-30kΩ
C-B	50kΩ-90kΩ	∞
C-E	40kΩ-80kΩ	∞

12 EXPLODED VIEW AND PARTS LIST

12.1. EXPLODED VIEW



12.2. PARTS LIST

NOTE:

1. When ordering replacement part(s), please use part number(s) shown in this part list.
   Do not use description of the part.
2. Important safety notice:
   Components identified by mark have special characteristics important for safety.
   When replacing any of these components, use only manufacture's specified parts.

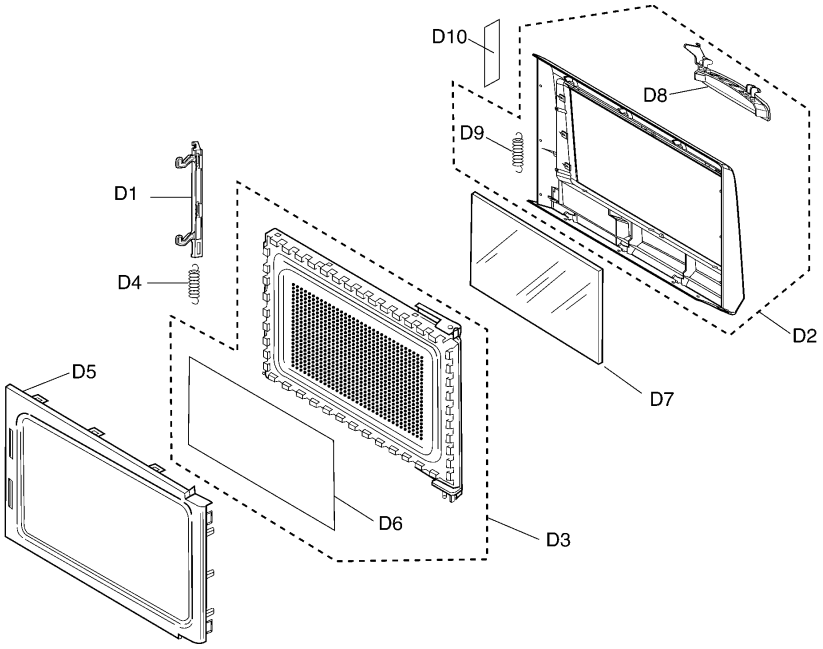
NOTE:

"A" parts are supplied by CSD (Japan)

"F" parts are supplied by PHAMOS (China)

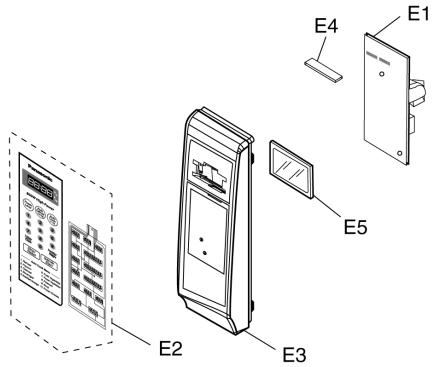
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
1		F00076S20BAP	NAME PLATE	1	S335BF APH
1		F00076S20HAP	NAME PLATE	1	S335WF APH
1		F00076S20HCP	NAME PLATE	1	S335WF CPH
1		F00076S20HRP	NAME PLATE	1	S335WF RPH
2		F10016S10XP	BASE	1	
3		F10084T00AP	RUBBER FOOT	2	
4		F110D6E70BXP	CABINET BODY (U)	1	S335BF
4		F110D6E70HXP	CABINET BODY (U)	1	S335WF/WM
5	⚠	F200A6S20AP	OVEN (U)	1	
6		F20556S20AP	COVER	1	
7		F21316E70XP	PULLY SHAFT	1	
8		F2177-F80	WASHER		
9		F290D6S10XP	ROLLER RING (U)	1	
10	⚠	F30206S10XP	DOOR HOOK	1	
11		F31365Q00AP	HOOK LEVER A	1	
12		F400A6S20AP	FAN MOTOR	1	
13		F4008-1E60	FAN BLADE	1	
14		F40256S10XP	AIR GUIDE A	1	
15		F41446S10XP	ORIFICE	1	
16		F612E5U40AP	INCANDESCENT LAMP (U)	1	
17	⚠	J61424T00AP	MICRO SWITCH	1	PRIMARY LATCH SWITCH
18	⚠	J61414T00AP	MICRO SWITCH	1	SECONDARY LATCH SWITCH
20	⚠	F61456S10XP	THERMAL CUTOUT	1	60°C ON,180°C OFF
21	⚠	J61784T00AP	MICRO SWITCH	1	SHORT SWITCH
22	⚠	2M210-M1F	MAGNETRON	1	APH,RPH
22	⚠	2M210-M1J	MAGNETRON	1	CPH
23	⚠	F6090-1H70	H.V.CAPACITOR	1	
24		F60376S10XP	CAPACITOR BRACKET	1	
25	⚠	F600B6R60AP	H.V.TRANSFORMER	1	
26	⚠	F605V6N60XP	DIODE (U)	1	
27	⚠	B62304000AP	FUSE	1	15A,125V
29		F63266S20AP	TURNTABLE MOTOR	1	
30	⚠	F900C6S20AP	AC CORD W/PLUG	1	APH,RPH
30	⚠	F900C6S20CP	AC CORD W/PLUG	1	CPH
31	⚠	F61456N00AP	THERMAL CUTOUT	2	-20°C ON ,120°C OFF
32		F60366S10XP	CAPACITOR INSTALLATION BRACKET	1	
33		F11656S10XP	REINFORCE BRACKET	1	
34		F60706S10XP	INSULATE BRACKET	1	
35		F603Y6S20AP	D.P.CIRCUIT (DU)	1	S335BF/WF APH
35		F603Y6S20CP	D.P.CIRCUIT (DU)	1	S335WF CPH
35		F603Y6S20RP	D.P.CIRCUIT (DU)	1	S335WF/WM RPH
36		F00069660AP	CAUTION LABEL	1	APH,RPH
36		F00067600CP	CAUTION LABEL	1	CPH
37		F00336S20AP	FUSE LABEL	1	
45		XTWFA4+12T	SCREW	4	FOR MAGNETRON
46		XTTANE4T12A0	SCREW	3	FOR CABINET BODY
47		XTTFA4+6BFZ	SCREW	2	FOR CABINET BODY SIDE (S335BF)
47		XTTFA4+6BN	SCREW	2	FOR CABINET BODY SIDE (S335WF/WM)

12.3. DOOR ASSEMBLY



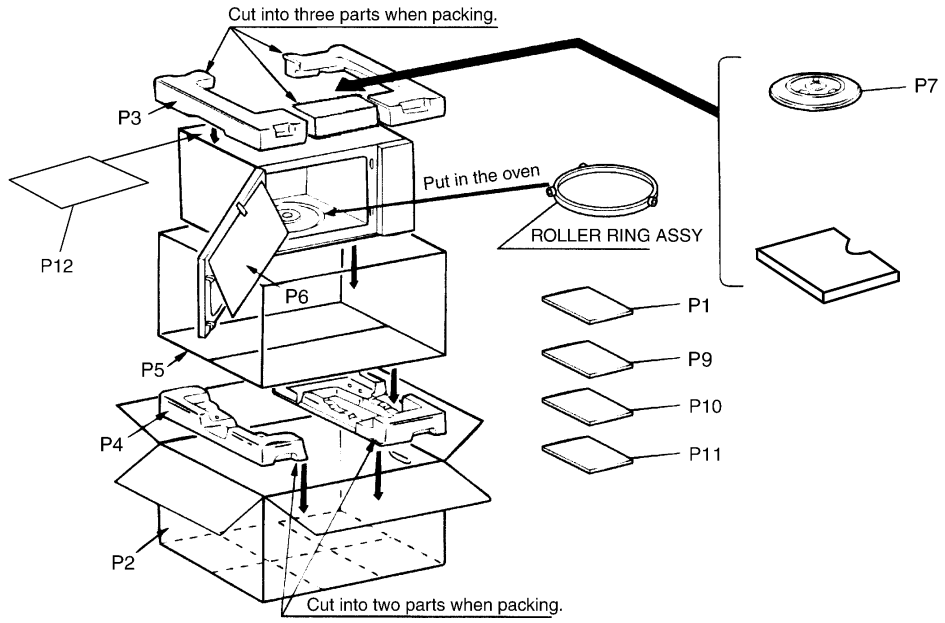
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
D1		F30186S10XP	DOOR KEY A	1	
D2	⚠	F301A6S10BXP	DOOR A (U)	1	S335BF
D2	⚠	F301A6S10HAP	DOOR A (U)	1	S335WF/WM
D3	⚠	F302K6S10XP	DOOR E (U)	1	
D4		F30216S10XP	DOOR KEY SPRING	1	
D5	⚠	F30856S10XP	DOOR C	1	
D6	⚠	F31455G10AP	DOOR SCREEN A	1	
D7		F31466S10XP	DOOR SCREEN B	1	
D8		F30126S10BXP	DOOR HANDLE	1	S335BF
D8		F30126S10HXP	DOOR HANDLE	1	S335WF/WM
D9		F30216S10XP	HANDLE SPRING	1	
D10		F02459660AP	DHHS LABEL	1	APH,RPH
D10		F04114180CP	HC LABEL	1	CPH

12.4. ESCUTCHEON BASE ASSEMBLY



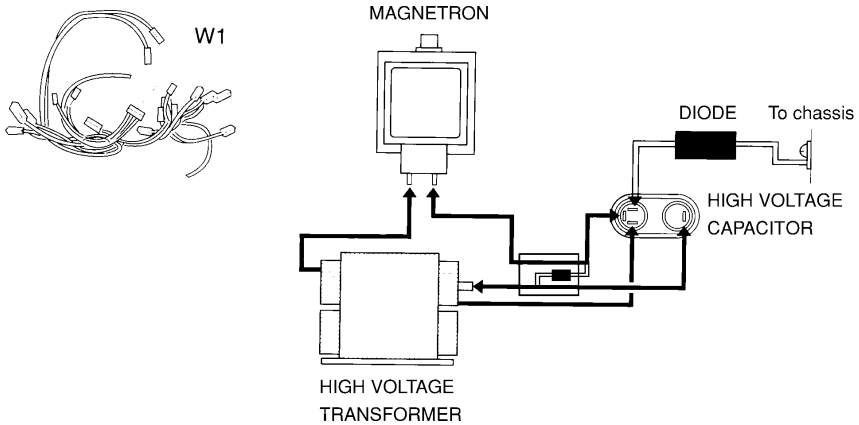
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
E1		F603L6S20AP	D.P.CIRCUIT (AU)	1	S335BF/WF APH
E1		F603L6S20CP	D.P.CIRCUIT (AU)	1	S335WF CPH
E1		F603L6S20RP	D.P.CIRCUIT (AU)	1	S335WF RPH
E2		F630Y6S20BAP	MEMBRANE SWITCH (U)	1	S335BF APH
E2		F630Y6S20HAP	MEMBRANE SWITCH (U)	1	S335WF APH
E2		F630Y6S20HCP	MEMBRANE SWITCH (U)	1	S335WF CPH
E2		F630Y6S20HRP	MEMBRANE SWITCH (U)	1	S335WF/WM RPH
E3		F80346S20BXP	ESCUTCHEON BASE	1	S335BF
E3		F80346S20HXP	ESCUTCHEON BASE	1	S335WF
E4		F67006S20XP	RUBBER CONNECTOR	1	
E5		AEDDHJ6S20XP	DISPLAY	1	

12.5. PACKING AND ACCESSORIES



Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
P1		F00036S20AP	INSTRUCTION MANUAL	1	S335BF/WF APH
P1		F00036S20CP	INSTRUCTION MANUAL	1	S335WF CPH
P1		F00036S20RP	INSTRUCTION MANUAL	1	S335WF/WM RPH
P2		F01026S20BAP	PACKING CASE,PAPER	1	S335BF APH
P2		F01026S20HAP	PACKING CASE,PAPER	1	S335WF APH
P2		F01026S20HCP	PACKING CASE,PAPER	1	S335WF CPH
P2		F01026S20HRP	PACKING CASE,PAPER	1	S335WF RPH
P2		F01027G80HRP	PACKING CASE,PAPER	1	S335WM RPH
P3		F01045G40XN	UPPER FILLER	1	
P4		F01056S10XP	LOWER FILLER	1	
P5		F01068100XN	P.E BAG	1	
P6		F01075G10XN	DOOR SHEET	1	
P7		F06016D00XN	COOKING TRAY	1	
P9		F00065G40AP	CAUTION LABEL	1	APH,RPH
P10		F01565U40RP	NOTICE	1	RPH
P11		F04456S20HCP	OVERLAY	1	S335WF CPH
P12		F01925E60XN	SHEET	1	S335BF

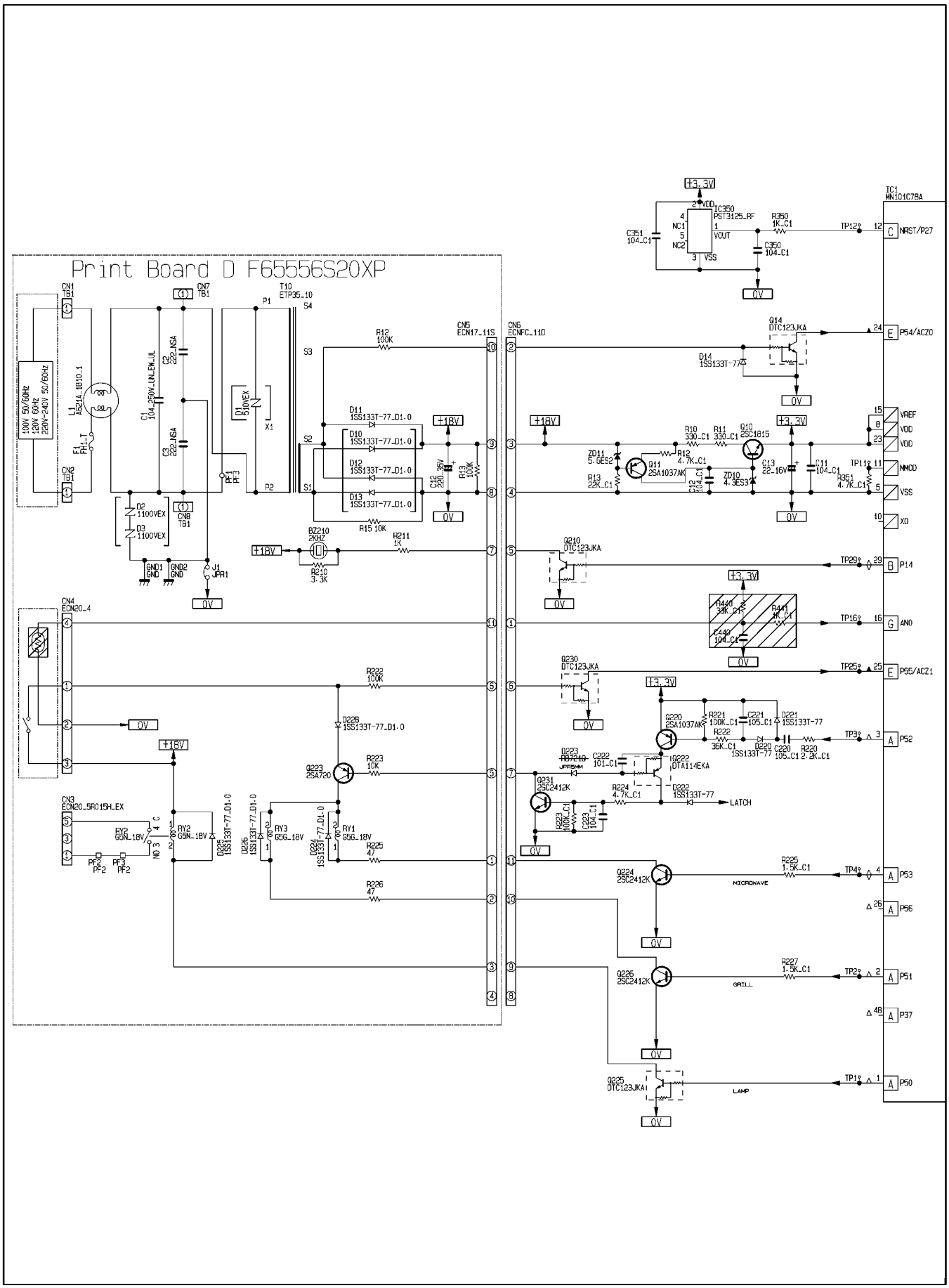
12.6. WIRING MATERIALS

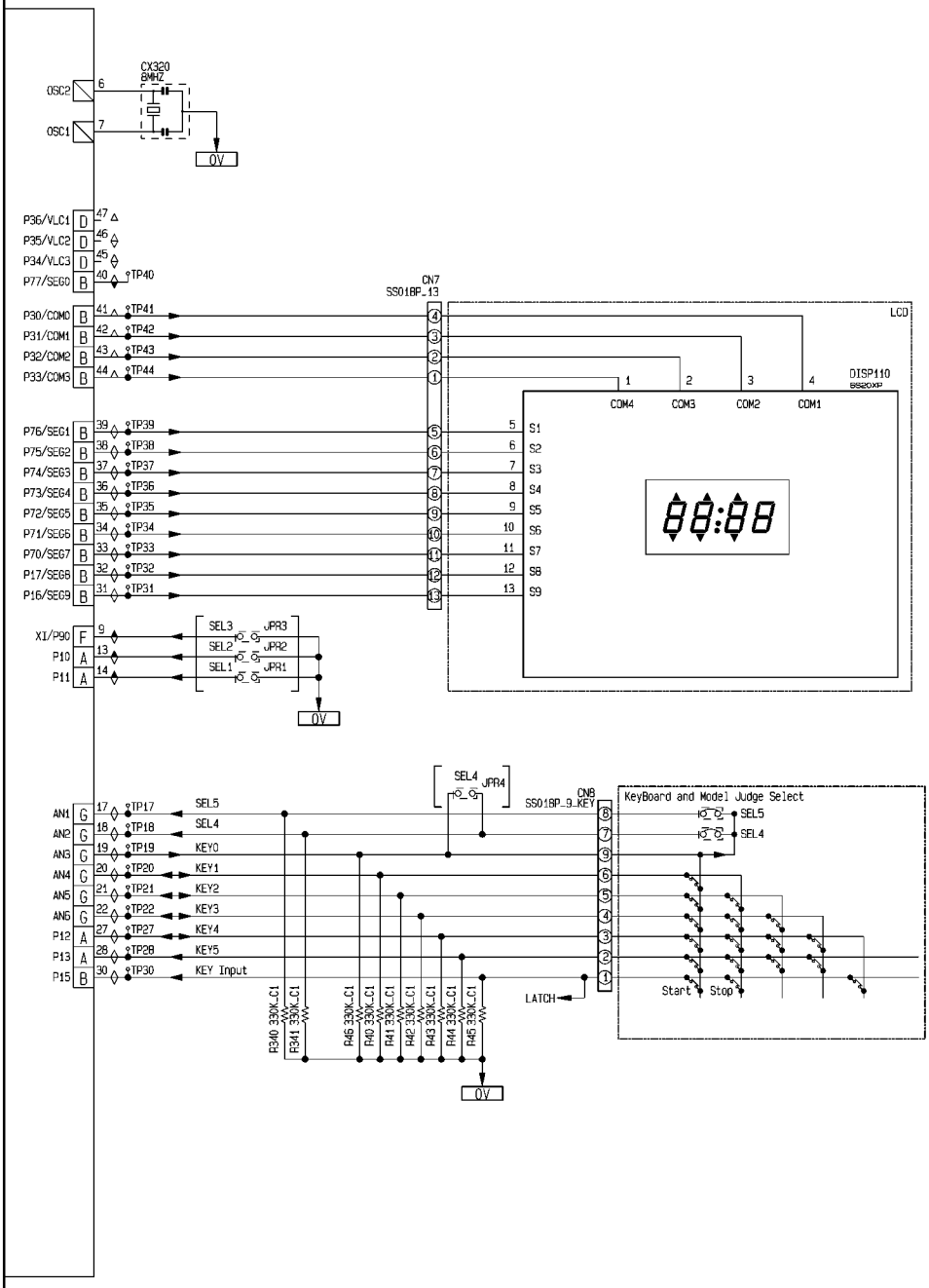


Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
W1		F030A6S20AP	LEAD WIRE HARNESS	1	APH,RPH
W1		F030A6S20CP	LEAD WIRE HARNESS	1	CPH

13 DIGITAL PROGRAMMER CIRCUIT

13.1. SCHEMATIC DIAGRAM





P.C.B Au	JPR4	JPR3	JPR2	JPR1	P.C.B Du	D1	D2.D3	D10.D12	D13
F603L6S20XP	OPEN	OPEN	OPEN	OPEN	F603Y6S20XP	510V	YES	YES	YES
F603L6R60XP	OPEN	OPEN	SHORT	OPEN	F603Y6S20XP	510V	YES	YES	YES
F603L6S20AP	OPEN	OPEN	OPEN	OPEN	F603Y6S20AP	270V	NO	NO	SHORT
F603L6S20RP	OPEN	OPEN	OPEN	SHORT	F603Y6S20RP	270V	YES	NO	SHORT
F603L6S20CP	OPEN	OPEN	SHORT	OPEN	F603Y6S20CP	270V	YES	NO	SHORT
F603L6S20WT	OPEN	OPEN	SHORT	SHORT	F603Y6S20WT	270V	YES	NO	SHORT

13.2. PARTS LIST

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
BZ210		AEFBAT2001WQ	BUZZER	1	2.0KHz
C12		AECETS1V221B	AL CHEM CAPACITOR	1	220µF/35V
C222		AECUU06C101J	CHIP CAPACITOR	1	100PF/50V
C11,C12,C223,C350,C351		AECUT06F104Z	CHIP CAPACITOR	5	0.1µF/25V
C220,C221		AECUN06F105Z	CHIP CAPACITOR	2	1µF/10V
C13		AECETS1C220B	CHIP CAPACITOR	1	22µF/16V
C1		ECQU2A104MNA	CAPACITOR	1	0.1µF/250V
C2,C3		ECTJ10222ME	CAPACITOR	2	0.0022µF/250V
CN1,CN2,CN7,CN8		F62146D00XN	CONNECTOR	4	
CN3		K1KA03AA0115	CONNECTOR	1	
CN4		F03536S20XP	LEAD WIRE HARNESS	1	
CN5		K1MN11A00008	CONNECTOR	1	
CN6		F65906S20XP	FLAT CABLE	1	11 pin
L1		F621A6S20AP	FILTER COIL	1	APH,CPH
CX320		EFOEC8004A4	CERAMIC RESONATOR	1	8.00MHz
D14,D220-D225,D228		AESS133T-77	DIODE	8	
D1		AERZ511KSBN	VARISTOR	1	
D2,D3		AERZ102KSBN	VARISTOR	2	CPH,RPH
D11		AESSRCT1A6-E	DIODE	1	
IC1		MN101C78ADF	L.S.I.	1	
IC350		COEBE0000401	CMOS CHIP	1	
Q10		2SD1859TV2Q	TRANSISTOR	1	
Q11,Q220		2SA1037AK	CHIP TRANSISTOR	2	
Q222		AESA14EKE	CHIP DIGI-TRANSISTOR	1	
Q14,Q210,Q225,Q230		AESC23JKE	CHIP DIGI-TRANSISTOR	4	
Q224,Q231		2SC2412KT146	CHIP TRANSISTOR	2	
Q223		B1ACGF000004	AUDION	1	
R350		AERJ06J102R	CHIP RESISTOR	1	1KΩ,1/10W,5%
R221,R223		AERJ06J104R	CHIP RESISTOR	2	100KΩ,1/10W,5%
R225,R227		AERJ06J152R	CHIP RESISTOR	2	1.5KΩ,1/10W,5%
R220		AERJ06J222R	CHIP RESISTOR	1	2.2KΩ,1/10W,5%
R13		AERJ06J223R	CHIP RESISTOR	2	22Ω,1/10W,6%
R10,R11		AERJ06J331R	CHIP RESISTOR	2	330Ω,1/10W,4%
R40-R46,R340,R341		AERJ06J334R	CHIP RESISTOR	9	330KΩ,1/10W,6%
R222		AERJ06J363R	CHIP RESISTOR	1	36KΩ,1/10W,7%
R12,R224,R351		AERJ06J472R	CHIP RESISTOR	3	4.7KΩ,1/10W,6%
R211		D0AF102JA155	CARBON RESISTOR	1	1KΩ,1/4W,5%
R15,R223		D0AF103JA155	CARBON RESISTOR	2	10KΩ,1/4W,5%
R12,R13,R222		D0AF104JA155	CARBON RESISTOR	3	100KΩ,1/4W,5%
R210		D0AF332JA155	CARBON RESISTOR	1	3.3KΩ,1/4W,5%
R225		D0AF470JA155	CARBON RESISTOR	1	47Ω,1/4W,5%
RY1		AEGG5G1A12	POWER RELAY	1	
RY2		AEBLD118	POWER RELAY	1	
T10		AETP284T0AP	LOW VOLTAGE TRANSFORMER	1	
ZD10		BOBA4R400002	ZENER DIODE	1	
ZD11		AESZMTZJ5R6B	ZENER DIODE	1	
F1		A62316010BP	FUSE HOLDER	2	

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